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The Information-Based RMA and the Principles of War

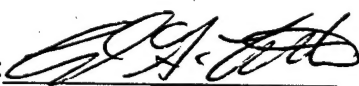
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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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ABSTRACT

The US military is currently experiencing a Revolution in Military Affairs (RMA) which has the potential to increase its combat capability "orders of magnitude" over any potential adversary. The essence of this "revolutionary" affair is that the character and conduct of warfare is undergoing a significant change driven primarily by the ability to acquire, collect, disseminate, and employ information in a very rapid manner.

Conversely, there are many reasons to believe that warfare is more evolutionary than revolutionary. There is a body of thought that suggests that there has always been in existence certain "principles of war" that are immutable, timeless, and independent of place or situation. If the information-based RMA has the potential to deliver on its promises, we must begin to embrace it by reexamining the underlying elements of our doctrine, the principles of war, and insure they lay the proper foundation for the military of the 21st century. We should challenge the current paradigms we hold and begin to think of these principles in new ways, some being radical departures from the "old school" solution. We must choose the words and definitions in our publications carefully, for they serve to convey to our soldiers what we hold to be true about the ways in which we wage war.

Introduction

One cannot read many articles in today's military, strategic, or national security journals without stumbling upon the topic of an emerging Revolution in Military Affairs (RMA). Many writers are promoting the idea that the character and conduct of warfare is undergoing a significant change driven primarily by the ability to acquire, collect, disseminate, and employ information in a very rapid manner. The essence of the information-based RMA (the term I will use) is that it is revolutionary, rather than evolutionary, and will provide increases in the combat capability of an armed force "orders of magnitude" over any potential adversary who has not mastered the information-based RMA themselves.

Conversely, there are many reasons to believe that warfare is more evolutionary than revolutionary. There is a body of thought that suggests there has always been in existence certain "principles of war" that are immutable, timeless, and independent of place or situation. The principles of war are not doctrine, but they serve as a doctrinal foundation in the sense that they are held to be common truths about the way in which one should prosecute war, especially at the operational level.

In order to embrace the full potential of the information-based RMA, it will be important to examine the changes it may bring to our understanding of the basic elements of our doctrine, the principles of war. Joint Publication 3-0 tells us, "The principles of war guide warfighting at the strategic, operational, and tactical levels. They are the enduring bedrock of US military doctrine." If the principles of war truly function as the "bedrock" of our military doctrine, they should be continually examined for correctness, pertinence, and applicability to the way in which we will conduct warfare in the 21st

century. We must ask ourselves some hard questions, such as: Will total battlespace awareness minimize the principle of surprise or perhaps render it obsolete? Will mass be defined in a totally different way? Will the principle of the offensive become dominant among the principles of war? Will some new principles become applicable as the technology and conduct of warfare change?¹

The focus of this paper will be to analyze the current principles of war based upon the emergence of an information-based RMA. In order to build a solid basis, I will begin by providing a discussion of the significant issues concerning both the RMA and the principles of war. Next, by using the information-based RMA as a lens to focus my efforts, I will examine its impact on the principles of war. For the purposes of brevity, I will analyze only those principles which I believe will be most effected. Finally, I will propose changes concerning the principles of war and offer recommendations.

Principles of War: A Historical Perspective

The principles of war: Objective, Offensive, Mass, Economy of Force, Maneuver, Unity of Command, Security, Surprise, Simplicity. Military officers first learn of these principles as lieutenants and seek to refine their understanding throughout their careers. They hold a place of importance in our doctrine-based force and serve as a “guiding light” to those who would seek success on the battlefield. To facilitate an understanding of these principles, I will briefly address three basic questions. 1) What constitutes a “principle?” 2) Where did they come from? 3) And, what is their significance to the warfighter today?

The principles of war are not expressed in neat algebraic formulas nor do they possess the same characteristics as the laws of nature and science. We teach that these principles

should not be adhered to blindly and that each principle may apply directly to one situation and not at all to another. Many even argue that since war is an art and not a science, in the truest sense of the word, principles do not apply to war. But war is both art and science. "Science consists of knowing; art of doing."² Regardless, "no art exists without certain fundamental truths, which can be derived from analysis, from logic, and from the successes and failures of those who have plied the art."³ The bottom line is this: a "principle" of war is, in practice, "a guide to action concerning the application of combat power, rather than an unquestioned truth with universal application to every single military operation."⁴

Antonine-Henri Jomini was probably the first individual whose writings led to the concept that a small set of principles could serve as a guide for the commander to succeed on the battlefield.⁵ Jomini wrote, "The fundamental principles upon which rest all good combinations of war have always existed, and to them all others should be referred for the purpose of arriving at their respective merits. These principles are unchangeable; they are independent of the arms employed, of times, and of places."⁶ Following WWI, the British adopted the first official list of principles of war, due greatly to the influence of J.F.C. Fuller, which included eight items: Maintenance of the Objective, Offensive Action, Surprise, Concentration, Economy of Force, Security, Mobility, and Co-Operation.⁷ In 1921, when the U.S. War Department listed principles of war in Training Regulation 10-5, eight of the nine principles listed were identical to those of British origin.⁸ However, between the years of 1928 and 1949, not a single definitive list of the principles of war appeared in any official U. S. Army doctrine manual. The list of nine principles that we currently use today did not appear in the U.S. Army Field Service

Regulations until 1949.⁹

It is also interesting to note that the principles of war are not the same throughout the major militaries of the world. The U.S. military currently holds that there are nine principles, the French only three, and the British and Russian military, ten. These principles, even though there is a great degree of similarity in name, are different in definition and application across the board.¹⁰

This historical perspective highlights several issues. First, the very concept that a certain limited number of "principles", by which warfare should be conducted in all situations and for all times, even exists and can be codified into nine, ten, or eleven principles has always been and still is under debate. Even if a set of "principles of war" do exist, their exact number, content, and definition is a second area of disagreement. Finally, history reveals that even in our own experience as a military, there has not been homogeneous thought about the concept or the content of the principles of war.¹¹ Russell Glenn provides an excellent summary in his article, "No More Principles of War?" He states, "History reveals that the principles of war have frequently been the subject of long and often inspired debate; their character, number, and definition have changed repeatedly. They took their present form in U.S. Army doctrine only 49 years ago. On the one hand, this span is but a fraction of the years spent in their study. On the other, much has transpired since 1949. One may legitimately ask whether the principles as they stand could meet the needs of U.S. armed forces half a century from now."¹² We, too, should consider the same question, but more specifically, will they meet the needs of the information-based warrior?

Revolution in Military Affairs: The Information-Based RMA

Exactly what is a Revolution in Military Affairs? In his article "Calvary to Computer, The Pattern of Military Revolutions", Andrew Krepinevich describes an RMA as "what occurs when the application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaptation in a way that fundamentally alters the characteristics and conduct of conflict. It does so by producing a dramatic increase--often an order of magnitude or greater--in the combat potential and military effectiveness of armed forces."¹³ The key proponents of the current information-based RMA state that a combination of high-tech sensors, robust information systems, focused intelligence, stealth technologies, advanced C4, and precision weapons will enable the commander to "see and understand everything on a battlefield, and if you see the battlefield, you will win the war."¹⁴ Admiral William A. Owens, former Vice Chairman of the JCS, was one of the early advocates of the information-based RMA. He believed that if the U.S. armed forces could integrate its currently procured subsystems into a higher "systems-of-systems," it would be able to achieve and sustain "information dominance." By communicating this information rapidly throughout the forces they would be able to react with speed, precision, and accuracy that would produce a devastating effect upon the enemy and "propel the U.S. military to a qualitatively new order of military power."¹⁵ In relation to the principles of war, it is critically important to note that it is often the operational innovation, or doctrinal changes, that prove to be more important to the full development of the RMA than is the element of technology itself.

The Principles of War: A New Paradigm

Guiding principles are important to any organization for they form a paradigm that serves as the basis for the way in which its members think and act. In our doctrine-based military, the principles of war serve to form our paradigm concerning the art of war. We must choose our words and definitions carefully, for they convey to our soldiers what we hold to be true about our profession. If the information-based RMA has the potential to deliver on its promises, then we must begin to embrace it by reexamining the underlying elements of our doctrine, the principles of war. The following paragraphs will examine six of the principles which may be most effected by the emergence of information-based warfare.

MASS

The purpose of mass is to concentrate the effects of combat power at the place and time to achieve decisive results.¹⁶

The advent of the information-based RMA may cause us to think of the principle of mass in a significantly different manner. Most will agree that the tactics used by the 8th Air Force in WWII, in which hundreds of B-17 bombers delivered thousands of tons of bombs on the factories and towns of Germany in the attempt to destroy one single target, is a thing of the past. Today, with the advent of high-tech weapons systems, soldiers no longer talk of massing forces, but of massing effects. It is no longer required to bring forces into the same geographical area to bring their effects to bear on the same target and, in fact, on the modern battlefield it may be dangerous as well.

Consider Colonel Phillip Meilinger's statement that "the result of the trend towards 'airshaft accuracy' in air war is a denigration in the importance of mass."¹⁷ He goes on to say that, in reality, what we have been seeking all along is not mass (any large amount or

number) but density (mass per unit volume).¹⁸ It is a waste of resources to “over-destroy” the target, but neither do we want to have to come back again to finish the job another day. What we ultimately desire to achieve is the right effect on the right target at the right time. Mass has nothing to do with one F-117 Stealth Fighter delivering a precision-guided weapon down the airshaft of a telecommunications building with the resulting effect of destroying the main critical node contained in that building. That particular attack involved one airplane delivering one weapon, but had the same effect as hundreds of B-17s.

We should reconsider the concept of mass as used by Napoleon and WW II air campaign planners and refine our understanding of this principle for three reasons. First, precision guided weapons are expensive, and in the climate of reduced budgets we must be somewhat judicious in the employment of these weapons. In an attempt to destroy a peer competitors information infrastructure we may soon realize that the number of targets required to be hit could place a strain on the number of available weapons. That is not to mention the possibility of fighting a second major regional conflict within a short period of time, as our current military strategy requires. Second, if we are required to resort to physical destruction of information-based targets, they are likely to be located (or co-located) in urban areas that have a highly concentrated civilian population. In this instance we will probably not be able to employ a large amount of non-precision firepower (traditional mass) because the American people will require that we avoid civilian casualties. Third, a significant factor of the information-based RMA will be speed with which wars are won or lost. If our objective is to bring strategic paralysis to our enemy before he has to chance to do the same to us, we must deliver the right weapon

to the right target the first time. Logistical constraints will demand that we not bring more than we need, which may leave some targets uncovered, and we may not be given a second chance if peer competitor is equally successful at attacking us. We should begin to think in terms of "density," rather than "mass," as this word more fully exemplifies the concept of rapid precision strike that the US military will need to embrace as this information-based RMA unfolds.

Objective

The purpose of the objective is to direct every military operation toward a clearly defined, decisive, and attainable objective.¹⁹

Field Manual 100-5, Operations, published by the U.S. Army, states as its first sentence in the explanation of the principle of objective, "The ultimate military purpose of war is the destruction of the enemy's armed forces and will to fight." However, the information-based RMA, with its promise of the capability to render the enemy "strategically paralyzed" in a relatively short period of time focuses less on the enemy's armed forces and more on his leadership, C2, and infrastructure. In addition, the continuing improvements in sensors, the "sensor-to-shooter" information systems, and the accuracy of precision weapons means that in the future more of the enemy's forces will be seen and more of what is seen can be destroyed. John Orme states, "Once the (information-based) RMA power has demonstrated the ability to kill nearly all of what it sees, simply communicating to the enemy that 'we know where you are' may be enough to persuade them to surrender or withdraw."²⁰ So, even though the principle of the objective will retain its importance, the information-based RMA may serve to refocus it away from the long standing concept of the destruction of the enemy's armed forces.

Another aspect to consider is time, that is, when in the course of a conflict should one

consider the principle applicable? Traditionally, commanders have thought of the objective in predominantly physical terms, such as a ridgeline, an enemy force, or as a condition to be achieved, such as air superiority. This paradigm tells us the "objective" is achieved primarily by "force-on-force" and does not apply until hostilities are eminent. However, with the advent of the information-based RMA, the early struggle for information dominance may begin by simply inserting a computer virus into the enemy's C4I networks. This could occur days, weeks, or even months before the onset of forces being employed. Thus, commanders may now wish to consider their "objectives" much sooner than in the past, as well as thinking of this principle as much in "intangible", as well as tangible, ways.

Offensive

The purpose of an offensive action is to seize, retain, and exploit the initiative.²¹

Throughout the history of warfare theorists have sought to determine the stronger position in war, the offensive or the defensive. Traditionally, most have agreed with Clausewitz, "we must say that the defensive form of warfare is intrinsically stronger than the offensive."²² However, the information-based RMA will reinforce the principle of the offensive and possibly reverse this long-held axiom. It has always been clear to military commanders that you do not achieve victory in most conflicts without some offensive action. The offensive also allows the commander to maintain the initiative, forcing the enemy to react rather than act as he wishes, and denying him the opportunity to pursue his own objectives.

Maintaining and exploiting the initiative is all about attaining information dominance. The "fog of war," which serves to paralyze the commander and leads to inaction, is due

primarily to a lack of information concerning his opponent. He is reluctant to act for fear of failure but knows that he must do something or forfeit the initiative. The information-based RMA, by establishing information dominance, will serve to lift the "fog" for the commander relative to his opponent and make him more eager to act. Major Aresenio T. Gumahad states, "These future warriors will quickly outflank and outmaneuver an enemy with knowledge of its position and combat situation. With information age weapons at their disposal they will engage an enemy precisely and decisively."²³ This confidence in the individual commander's ability to seize and maintain the initiative will provide a synergistic effect on the battlefield and serve to propel the "order of magnitude" effects this RMA will produce.

Also, the age old requirement for the offense to concentrate forces in order to break through the defense is greatly reduced under the information-based RMA. John Orme predicts, "With continued improvements in the range and accuracy of weaponry and the effectiveness of command and coordination, it will become increasingly possible for the offense to concentrate fire but not forces before the enemy, which may shift the eternal contest between offense and defense decisively in favor of the attacker."²⁴

Another aspect favoring the offensive is the speed in which an information-based RMA force will be able to act. Wars may no longer last months or even years. The requirement to establish information dominance early in a conflict may require a massive preemptive attack on the enemy's information infrastructure as well as his capability to retaliate in kind. One who waits too long may find that he is unable to launch credible resistance very soon after hostilities breakout. These issues considered, the information-based RMA should cause us to examine the traditional balance between the offensive and

the defensive roles of warfare.

Economy of Force

The purpose of the economy of force is to allocate minimum essential combat power to secondary objectives.²⁵

At the heart of the current concept of economy of force is the need to preserve combat power for sustained and follow-on operations. This principle focuses one to think of a campaign primarily in a sequential nature in which several enabling objectives are achieved prior to ultimately arriving at the final goal. Lt Col Frederick Strain, USAF, in his article "The New Joint Warfare" describes it this way, "Each phase establishes the requisite environment or conditions for the next operation. Developing campaign plans designed to "peel the onion" layer by layer to get to the center of gravity is old thinking."²⁶ The Gulf War demonstrated the capability to attack the enemy at all levels - strategic, operational, and tactical- simultaneously, in a brief period of time, and effectively "locked out" many of Saddam's options very early in the conflict. As the information-based RMA unfolds, warfare will become less sequential and more simultaneous, promoting the concept of parallel attack in future campaign operations.

The information-based RMA may require us to we think differently about the concept of reserve forces also. The following comments by General Dennis Reimer, Chief of Staff of the U.S. Army help to illustrate this point. "We talk now about situational awareness...if we can do that (achieve it) we can change the way we operate. If you go to Ft. Leavenworth they teach in terms of operations when there is uncertainty and risk you keep a large reserve. Generally, most of the Army students will tell you it's two (units) up and one (unit) back. That's the way it has been for a long time. But if you can take that risk out of there, you can get more of your combat systems in the fight."²⁷ The

primary reason to keep forces in reserve is to preserve combat power to be able to counter the unpredictable nature of the enemy. If information dominance renders the enemy significantly more predictable, the logic for a reserve force becomes less valid. The result is that the information-based RMA will allow JFCs to employ forces in a more simultaneous than sequential manner, as well as employing more of the force from the onset of hostilities.

Unity of Command

The purpose of unity of command is to ensure unity of effort under one responsible commander for every objective.²⁸

Military units have traditionally been hierarchical organizations with the commander at the top and many successive layers to the bottom. In a hierarchy there are strictly defined lines of communication, known as "the chain of command," in which data and information go up and commands come back down.²⁹ New data is routed to commanders, who assess its impact and then direct an organizational response. However, members of a hierarchy routinely act on incomplete information because they receive only the command and not the information underlying it. Therefore, subsequent decisions on the lower levels are likely to be made on incomplete or late data resulting in uninformed action.³⁰

Another characteristic of a hierarchy is that each successive level upward in the chain of command is likely to have a "bigger picture" of the battlefield than the last, thus rendering the commander the most capable individual in the unit to make decisions.³¹ However, consider the effect the information-based RMA will have on this hierarchical structure. What if the individual at the lower level was able to acquire the same "big picture" as the individual at the top? Before, the individual acted without question

because all he received was a command without the underlying information, now this may no longer be true. Imagine, as well, the situation described by Major James K. Morningstar, "It is easy to envision brigade commanders having to fight the urge to bypass less experienced battalion and company commanders to guide platoon leaders at objectives via direct digital links."³² The information-based RMA will force our "chain of command" to function more like a network (in a pure network, all individuals are equal and autonomous, all possible lines of communication can be used, there is no leader, any individual can interact directly with any other individual, and all decisions are reached by consensus) resulting in a more flattened and responsive command structure. In this sense, the information-based RMA may challenge our current "hierarchical" concept of unity of command.

Surprise

The purpose of surprise is to strike the enemy at a time or place or in a manner for which it is unprepared.³³

The principle of surprise will be defined in two entirely different ways depending on whether or not we are fighting a peer-competitor. If we are engaging an adversary who has not mastered the information-based RMA, the principle of surprise could be an important aspect of the way we will employ force. Throughout the history of warfare the element of surprise has been the exception rather than the rule. Forces were seldom surprised because of their ability to understand the enemy and to plan for his most likely courses of action. However, by achieving information dominance early on in the conflict, we will be able to "see" and "engage" the enemy's forces, while denying him that same capability. This ability to "surprise at will" may cause the enemy to withdraw or surrender simply by communicating to him that "we know where you are."³⁴ In this

instance surprise may become the norm, rather than the exception, for an information-based RMA power.

Conversely, with the capability of a peer-competitor to employ surveillance technologies and rapidly communicate information to his forces, the ability to "surprise at will" will probably not be a realistic option. In this type of conflict the principle of surprise will be defined by two key elements: stealth and speed. "Stealth strengthens the attacker by restoring the prospects for surprise, perhaps close to the levels prevailing before the invention of radar, while accuracy radically diminishes the number of aircraft and tonnage of bombs needed to destroy a given set of targets."³⁵ For example, in Operation DESERT STORM F-117 Stealth Fighters flew more than 1,250 sorties, attacking valuable strategic targets in downtown Baghdad, without losing a single aircraft. Additionally, the speed at which information-based RMA forces will be able to act will allow them to continually operate inside the enemy's decision cycle always leaving our opponent a step behind.

The 10th Principle of War: Legitimacy

Not only will the information-based RMA alter our understanding of the current nine principles of war, entirely new principles may become applicable, such as the "Principle of Legitimacy." The American people are a large part of the American way of war, but the current principles give no consideration to this important fact. Long ago, Clausewitz wrote that war was not only the business of the military and the government, but of the people, as well. More recently, the so-called Weinberger and Powell Doctrines urged that the U.S. military should not be employed unless they enjoyed the support of the American people. Several articles have been written over the years that proposed the

principle of morale should be added to the current list of principles. The morale of the troops is a very important factor, but the principle of legitimacy is much more encompassing than the morale of the military alone. Legitimacy encompasses the morale of the nation, and perhaps that of the entire world.

This information age we are currently experiencing is forever changing the way in which Americans view national and world events. Consider the impact of millions of people viewing the battlefield in real time from their living rooms every evening. According to Major A. J. Echevarria, "Images of war and peace--either real or contrived--(will be able to) decisively influence national will or public opinion before authorities confirm or repudiate their authenticity."³⁶ CNN is now able to cover any conflict from the first deployment to the last shot fired, virtually as it unfolds. This trend will increase, as we are not far from the day when the war reporter will have the capability to transmit real-time video and audio feed directly from the battlefield.

Another aspect of the principle of legitimacy is the fact that the U.S. has shown reluctance to act unilaterally in recent years, not for lack of military capability, but for the political realities of favorable world opinion. Americans, historically isolationists, have always sought the "moral high ground" when it comes to using force. Precisely because we are now the world's only superpower, the U.S. will continue to seek coalition partners in order to avoid being labeled the "bully" of the free world.

We should have learned to heed the principle of legitimacy as a result of the Vietnam War. Our inability to properly address this important issue cost us dearly in that conflict. Military theory, historical perspective, and future realities make it clear that commanders should consider the impact of legitimacy just as importantly upon their future military

operations as they considered mass, maneuver, and security in the past.

Conclusion

The information-based RMA, characterized by its ability to collect, digest, and distribute vast amounts of information, all at incredible speeds, promises to lift the “fog of war” and increase our military capability “orders of magnitude” above our peers. However, we should not forget that it is often the operational innovation, or doctrinal changes, that prove to be more important to the development of the RMA than is the technological element itself. In order to fully realize the potential of the information-based RMA we must challenge the paradigms we have formed concerning the “enduring bedrock” of our military doctrine, the nine principles of war. Commanders of tomorrow must think differently about the ways in which these principles govern and guide the employment of our “information warriors” of the future. We must constantly examine these principles and allow them to evolve along with the “advances in technology, adaptations by adversaries and potential adversaries, better understanding of military theory, and revisions in national strategy.”³⁷ The revolution of the information-based RMA has shown us the times have changed, so must the paradigm we hold of the principles of war.

Recommendations

My recommendations are fourfold. First, intermediate and senior service schools should review and revise their curriculum concerning the principles of war. The course material should include a brief discussion of the history of the principles of war, focusing on their evolutionary and changing nature. It should also include a discussion that serves to encourage officers to constantly challenge each principle in name and meaning. The

service schools must not allow students to accept the current nine principles of war without encouraging them to challenge their applicability to the current and future methods of operational art. Secondly, the Naval War College should sponsor an essay contest to encourage officers to think and write about new principles of war (or old principles with new applications) that will enhance the U.S. military's ability to adapt organizationally and doctrinally to the information-based RMA. Thirdly, JCS should consider revising the principles of war and associated explanations found in joint publications to include the relevant issues highlighted by the information-based RMA and JV 2010. Finally, Joint Force Commanders should consider future exercises and maneuvers that will enable our forces to capitalize on the promises of the information-based RMA and promote a new paradigm for the understanding and application of the principles of war.

NOTES

- ¹ Additionally, as I was preparing to write this paper I read many articles concerning the information-based RMA and many separate articles dealing with the principles of war. However, I failed to find a single article dealing specifically with the integration of the two concepts.
- ² C. R. Brown, "The Principles of War," Proceedings, June 1949, 623.
- ³ John I. Alger, The Quest For Victory, (Westport, Conn.: Greenwood Press, 1982.) ix.
- ⁴ Russell W. Glenn, "No More Principles of War," Parameters, Spring 1998, 56.
- ⁵ Alger, 18.
- ⁶ Marshall L. Fallwell, "The Principles of War and The Solution of Military Problems," Military Review, May 1955, 50.
- ⁷ Alger, 122.
- ⁸ Ibid., 140.
- ⁹ Ibid., 164.
- ¹⁰ Fallwell, 52.
- ¹¹ Ibid., 53.
- ¹² Glenn, 64.
- ¹³ Andrew F. Krepinevich, "Calvary to Computer, The Pattern of Military Revolutions," The National Interest, Fall 1994, 30.
- ¹⁴ Mackubin Thomas Owens, "Technology, the RMA, and Future War," Strategic Review, Spring 1998, 67.
- ¹⁵ James R. Blaker, "Understanding the Revolution in Military Affairs," The Officer, May 1997, 27.
- ¹⁶ Joint Chiefs of Staff, Doctrine for Joint Operations (Joint Pub 3-0) (Washington: 1 February 1995), A-1.
- ¹⁷ Phillip S. Meilinger, "Ten Propositions regarding Airpower," Airpower Journal, Spring 1996, 64.
- ¹⁸ Ibid., 65.
- ¹⁹ Joint Chiefs of Staff, Doctrine for Joint Operations (Joint Pub 3-0) (Washington: 1 February 1995), A-1.
- ²⁰ John Orme, "The Utility of Force in a World of Scarcity," International Security, Winter 1997/98, 147.

²¹ Joint Chiefs of Staff, Doctrine for Joint Operations (Joint Pub 3-0) (Washington: 1 February 1995), A-1.

²² Carl Von Clausewitz, On War, (Edited by Micheal Howard and Peter Paret, Princeton, NJ: Princeton University Press, 1976.) 358.

²³ Arsenio T. Gumahad, II, "The Profession of Arms in the Information Age," Joint Force Quarterly, Spring 1997, 17.

²⁴ Orme, 151.

²⁵ Joint Chiefs of Staff, Doctrine for Joint Operations (Joint Pub 3-0) (Washington: 1 February 1995), A-1.

²⁶ Frederick R. Strain "The New Joint Warfare." Joint Force Quarterly, Autumn 1993, 20.

²⁷ Dennis J. Reimer, Address to Naval War College, Newport, R.I., 12 January, 1999.

²⁸ Joint Chiefs of Staff, Doctrine for Joint Operations (Joint Pub 3-0) (Washington: 1 February 1995), A-1.

²⁹ John W. Bodnar and Rebecca Dengler, "The Emergence of a Command Network," Naval War College Review, Autumn 1996, 94.

³⁰ Ibid., 97.

³¹ Ibid., 94.

³² James K. Morningstar

³³ Joint Chiefs of Staff, Doctrine for Joint Operations (Joint Pub 3-0) (Washington: 1 February 1995), A-1.

³⁴ Orme, 147.

³⁵ Ibid., 152.

³⁶ Antulio J. Echevarria, II, "Dynamic Inter-Dimensionality: A Revolution in Military Theory," Joint Force Quarterly, Spring 1997, 30.

³⁷ Glenn, 53.

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